MATERIAL SAFETY DATA SHEET

SRM Supplier: **National Institute of Standards and Technology**
Standard Reference Materials Program
100 Bureau Drive, Mail Stop 2320
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RM Number: 8640
MSDS Number: 8640
RM Name: Microspheres with Immobilized Fluorescein Isothiocyanate

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SECTION I. MATERIAL IDENTIFICATION

Material Name: Microspheres with Immobilized Fluorescein Isothiocyanate

Description: This material consists of six sealed plastic bottles: five containing a suspension of microspheres with different amounts of labeled fluorescein isothiocyanate; one bottle containing a suspension of microspheres without immobilized fluorescein isothiocyanate. The suspension has a nominal microsphere concentration of 10^6 particles/mL. Each individual plastic bottle contains approximately 2.0 mL of the suspension.

The suspension buffer is a PBS buffer containing 15 mM sodium azide and 0.1 % tween 20.

Other Designations: **Microspheres** with Immobilized **Fluorescein Isothiocyanate** (FITC; fluorescein, 5-isothiocyanato; fluorescein 5-isothiocyanate; 5-isothiocyanatofluorescein; 5-fluorescein isothiocyanate) in **PBS buffer** (phosphate buffered saline) containing 15 mM **Sodium Azide** (hydrozoic acid, sodium salt) and 0.1% **Tween 20** (polyoxyethylene [20] sorbitan monolaurate; polysorbate 20; ethoxylated sorbitan monolaurate).

Information on Ingredients:

Name	Chemical Formula	CAS Registry Number
Fluorescein Isothicyanate Labeled Microspheres:		
Flourescein Isothiocyanate	$C_{21}H_{11}NO_5S$	3326-32-7
PBS buffer:		
Disodium Hydrogen Phosphate	Na_2HPO_4	7558-79-4
Sodium Chloride	NaCl	7647-14-5
Sodium Azide	NaN_3	26628-22-8
Tween 20	$C_{58}H_{114}O_{26}$	9005-64-5

DOT Classification: Not regulated by DOT

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Sodium Azide[a]	0.01	OSHA ceiling (skin): 0.3 mg/m^3
		ACGIH ceiling : 0.3 mg/m^3
		Human, Oral TD_{Lo}: 710 µg/kg
Tween 20[a]	0.1	No occupational exposure limits established.
Microspheres with Immobilized Fluorescein Isothiocyanate[b]		No occupational exposure limits established
		No toxicity data exists. The toxic properties have not been thoroughly investigated.

[a]Exposure limits and toxicity data provided are for the concentrated forms of sodium azide and tween 20. Their concentrations in this buffer, however, are very low, and it may be slightly irritating.
[b]The chemical, physical and toxic properties of this product, microspheres with immobilized fluorescein isothiocyante, have not been thoroughly investigated; however, the organic fluorescent dye, flourescein isothiocyanate, is a suspected carcinogen.

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Microspheres with Immobilized Fluorescein Isothiocyanate
Appearance and Odor: colorless, odorless, clear liquid suspension
Density: ~1.05 g/cm^3
Boiling Point: 100 ºC
Solubility in Water: highly soluble (water-based)

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable **Method Used:** Not Applicable **Autoignition Temperature:** Not Applicable

Flammability Limits in Air (Volume %): **UPPER:** Not Applicable
LOWER: Not Applicable

Unusual Fire and Explosion Hazards: The suspended material is not flammable. Sodium azide is a slight fire hazard and a severe explosion hazard. Sodium azide reacts with many heavy metals to form explosive compounds. Sodium azide also reacts with metal halides to give metal azide halides, many of which are explosive.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full-face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Sodium Azide:

Stability: _____ **Stable** __X__ **Unstable**

Sodium azide may explode when heated. Sodium azide may also form explosive compounds. See "Incompabilities (Materials to Avoid)" below.

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Avoid friction or contamination. See "Incompatibilities (Materials to Avoid)" below.

Incompatibilities (Materials to Avoid):

Microspheres with Immobilized Fluorescein Isothiocyanate: When exposed to light, fluorescent dyes may photobleach. In strong acid or base, the product may be non-reactive. Avoid oxidizing materials. **DO NOT** freeze; product may irreversibly aggregate.

Sodium Azide: Sodium azide is incompatible with acids, metals salts, halogens, reducing agents, metals, combustible materials, oxidizing materials. Sodium azide reacts with metal halides and heavy metals, such as lead and copper, to form explosive compounds.

See Section IV: "Fire and Explosion Hazard Data".

Hazardous Decomposition or Byproducts:

Sodium Azide: Thermal decomposition of sodium azide may form oxides of nitrogen.

Hazardous Polymerization _____ **Will Occur** __X__ **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: __X__ **Inhalation** __X__ **Skin** __X__ **Ingestion**

Health Hazards (Acute and Chronic): Microspheres with Immobilized Fluorescein Isothiocyanate may be irritating to the skin and mucous membranes if ingested. The toxic properties have not been thoroughly investigated; However, fluorescent dyes are suspected to be carcinogenic agents.

Sodium Azide: A local effect of sodium azide is irritation to the eyes, skin, and respiratory system. Acute exposure of sodium azide by inhalation, skin absorption, and ingestion is **highly toxic**. Chronic exposure may cause cancer or alter genetic material.

Eye Contact: Eye contact of sodium azide may cause irritation with redness, pain, and blurred vision. Chronic exposure may cause conjunctivitis.

Skin Contact: Contact to the skin may cause irritation with redness and pain. Skin absorption may be fatal.

Inhalation: Vapors or fumes may cause irritation to the mucous membranes. Other symptoms may include a moderate reduction in blood pressure, variable pulse rate, headache, dizziness, fatigue, nausea, and faintness. Exposure to high concentrations may result in convulsions and death.

Ingestion: May be fatal if swallowed.

Target Organs: nerves, heart, and brain

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Sodium Azide:

Eye Contact: Flush eyes with plenty of water for at least 15 minutes. Obtain immediate medical attention.

Skin Contact: Wash skin with soap and copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Obtain medical assistance.

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing by qualified personnel. If breathing is difficult, administer oxygen. Obtain immediate medical attention.

Ingestion: Obtain immediate medical attention. Drink plenty of water. **DO NOT** give anything by mouth to an unconscious or convulsive person.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Microspheres with Immobilized Fluorescein Isothiocyanate:

Steps to be Taken in Case Material Is Released or Spilled: Wear vinyl gloves. Soak up spill with paper toweling, sand, or other non-combustible material, and rinse with water. Collect spilled material in an appropriate container for disposal. **DO NOT** dispose of material down the drain. Sodium azide forms explosive chemical compounds with lead and copper plumbing. If suspicious of or accidental drain disposal, flush with copious amounts of water to prevent azide build-up.

Waste Disposal: Follow all federal, state, and local regulations.

Handling and Storage: Good room ventilation is adequate for handling. If there is a possibility of inhalation exposure to dried particles, wear a NIOSH approved dust respirator.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store unopened bottles at temperatures between 2 ºC and 6 ºC in the dark in an upright position. Keep refrigerated. **DO NOT** freeze. Store and use in accordance with the Report of Investigation for SRM 8640.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: Bangs Laboratories, Inc., MSDS *Fluorescently Labeled Polymer Microspheres*, 15 March 2002.
MDL Information Systems, Inc., MSDS *Phosphate Buffered Saline*, 15 December 2003.
MDL Information Systems, Inc., MSDS *Polyoxyethylene (20) Sorbitan Monolaurate*, 15 December 2003.
MDL Information Systems, Inc., MSDS *Sodium Azide*, 15 December 2003.
SRM 8640; *Microspheres with Immobilized Fluorescein Isothiocyanate*; National Institute of Standards and Technology, U.S. Department of Commerce: Gaithersburg, MD (2004).